CULTURAL CRITICISM OF SOCIETAL COMPUTERIZATION: A methodological problem of human science

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Abstract

In the process of outlining an ideal comprehensive research program about the meaning of the ever increasing societal use of computer, questions arise about presuppositions, consequences, and ethical imperatives that should direct of information technology. A subgroup is formed out of questions that were intuitively clustered around what historically recalls cultural criticism. At a preliminary stage of the formulation of the research program the questions have not yet been formulated except in terms of a "reader" that consists of an edited list of literature that is judged to be a relevant base for a subprogram of research about cultural criticism. The subprogram is outlined in terms of 1) An initial reference to the role of journalism and the critical press as compared with science, 2) The risk of converting cultural critical efforts into eclecticism, 3) The meaning of referring in the debates to "the information society", 4) The inclusion of some kind of aesthetic dimension, and 5) An illustration of the problematic meeting of human science and journalism in a particular newspaper article that does what many branches of disciplinary human science would find ilegitimate and not sufficiently rigorous. The paper ends advancing the question about which methodological aspects of human science prevent and facilitate the rigorous treatment of the issues that were hinted out within the institutional frame of disciplinary science.

On journalism and science

This is the first step of one part of a research program about the meaning of computerization, and it is cast in the form of a "reader". I wish to show how human science issues can arise spontaneously in research in so called computer science, information science or administrative data processing. I also wish to show how methodological issues of human science impinge on the legitimacy and possibility of acknowledging these issues in disciplinary long run research. Ultimately my implicit plea will be for support in casting these matters in "methodological" terms, if this is necessary in order to avoid journalistic eclecticism.

Modern scientific disciplines have specialized and narrowed to the point that many problems seem to require approaches characterized by the terms interdisciplinary, transdisciplinary, systems, or the like. Center for interdisciplinary or transdisciplinary science, as well as for thematic research (such as "Technology and social change) have been established in many places. Paradoxically they seem to attract scientists who feel that they are not allowed to cultivate their concerns within the

realm of their original disciplinary institutions, unless they happen to be departments of philosophy who were allowed by their faculties to get renamed as history of ideas, theory of science, or such. When I say paradoxically I mean that the "flight" from the original disciplinary arena may reinforce the (mis)understanding the such problems need not be treated in the disciplinary setting since they can always be ventilated in special "territorial reserves". They may resemble discussion clubs where scientists meet during evenings and weekends in order to revive their disciplinary disappointments. Eventually these new territorial reserves grow older and establish themselves as new territorial disciplines displaying the same transdisciplinary intolerance as their mother disciplines once did, and contributing therefore to the gradual fragmentation of our universities into multiversitarian colleges.

The point is that the basic problem may be one of policy of science in the sense that the important point of leverage for the whole question is to deepen each one's own *disciplinary* science to the point that it encompasses the global issues which should direct its long term development. If inter- or transdiciplinary centerns or international conferences are used not only as a temporary strengthening "refuge" but mainly as flight away from the home battlefront, their effects may be counterproducive. For instance, if I were to abandon the battle at my home disciplines of computer science and administrative data-processing in order to join a thematic research team on, say, technology & social change, or policy of science, or research on research, then I would probably weaken my present team's efforts to develop computer science and administrative data processing itself. My present colleagues would then not need to acknowledge my desperate attempts to convey my conviction that many modern buzzword-concepts like "computer supported cooperative work" (CSCW) and other concepts like "co-constructive computer applications" revive philosophical Kantian themes, and the cultural criticism which arised around them. For example, the possible relevance for CSCW of Johann Gottlieb Fichte's intersubjective conception of freedom as related to democratic reason the state, and religion, etc. would be left to the attention to philosophical specialists who in turn would claim that they unfortunately know nothing about computer science, and therefore must profess humble selfrestrain in their disciplinary scientific ambitions, and so on.

The trouble with such approaches is that they sometimes are too easily dismissed within the scientific and academic community under the charge of not being sufficiently scientific or, "worse", of being pure cultural journalism.

On closer inspection appears a paradoxical aspect of this charge in that the commercial-governmental market orientation of modern scientific research is often journalistic in the bad sense of the word. Its policies of evaluation, for instance, are admitted to call forth the "publish or perish" syndrome in an academic world that relies on international publications that are evaluated in terms of numbers of readers or, rather, copies sold in the affluent big science communities of the English-American speaking world. This is the background of phenomena like the "PROLOG-boom" in the last decade (Leith, 1987), a computer-analog to earlier observations about the dubious popularity of planning techniques such as Critical Path Method, Program Evaluation and Review Technique, or Program Planning and Budgeting (abbreviated CPM, PERT, PPB) (Churchman, 1971, pp. 92f; Hoos, 1983).

Sometimes the charge reaches so far as to claim that - yes - the approaches may be interesting *but* they deal with essentially "philosophical" matters. It is probably to the disadvantage of science and to its long run development to relegate certain overall responsibilities and intellectual issues to journalism just because it happens to have been less discussed and more vaguely defined than science. Besides this, it is paradoxically obvious for many of us that journalists stand, if possible, under still greater pressure of short run committments, politics and power than science itself.

We propose to reinstate and affirm the respectability of such studies by claiming that they are not proper of only advanced journalism but rather they are to be related to an intellectual tradition which melts with the debate on methodological matters of human science (Dilthey, 1989), and with other issues of cultural criticism.(Adorno, 1972). It has many roots back in time, some of them associated with the controversial name of Oswald Spengler (1981-1983/1918, including his critique of journalism in terms of the press), and, of course, further back in the philosophical tradition. Recently it has been explicitly perceived as an object of research in its own right, albeit in quite different perspectives, within e.g. the disciplines of economics (Köhnke, 1988) and computer and information science (Bødker, 1987; Docherty, & Ivanov, 1990; Forsgren, & Ivanov, 1989; Ivanov, 1986; Ivanov, 1988; Ivanov, 1989b; Ivanov, 1990a; Ivanov, 1990b; Stamper, 1988).

In what concerns philosophy proper, the term cultural criticism recalls the "criticism" as inaugurated in the work of Immanuel Kant. It is possible, however, that Kant has been accepted too promptly in our academic community, at its face value. Several new currents in systems science seem to adopt Kant's critical philosophy as a kind of basic assumption (Churchman, 1979), even if the need has been felt to develop it into a critical social theory, and further to a "critical heuristics of social planning" (Ulrich, 1983; Ulrich, 1989). and a "liberating systems theory" that is by now quite well overviewed (Flood, 1989; Gregory, 1989) and is mainly associated with the name of J. Habermas.

The above mentioned adoption of Kant in systems science apparently seldom takes into detailed account and discusses the extensive historical critique of Kant's philosophy besides that which may be seen as implicit in Marx's critique of Hegel. It is a critique which has played an important role in cultural criticism, e.g. concerning the role of emotions, art and religion relative to science, i.e. concerning the concept of science itself.

There have been lately some authors today , non necessarily "philosophers", who expose the shortcomings or at least the doubts rised by Kant's conceptions (Barrett, 1987, pp. 26, 51f, 79f, 83, 85f, 101-104, 109, more directly related to the computer phenomenon; Simmel, 1984, pp. 37, 48; Spengler, 1981-1983/1918). It is, however, remarkable, that no notice has been taken in modern criticism of our scientific culture of the earlier historical opposition to Kant. We find there Johann Georg Hamann (1730-1788) who contributed to the birth of German romanticism and influenced Goethe, Herder, Schelling, Hegel, Schleiermacher, Kierkegaard, and Nietzsche. In that tradition we find also Eduard von Hartmann (1842-1906) with his philosophy of the unconscious that would influence Carl Jung and the rise of analytical psychology, important as it may be for appreciating the import of cognitive science as applied to so called artificial itelligence. We find also a later philosophers and sociologist like the phenomenologist Max Scheler who refuses the formalism of the Kantian et-

hics that apparently characterizes the later positions of Churchman's systems ethics (as put forward in the "conversations" of the Journal for Systems Research).

It is then striking that Anglo-Saxon researchers not only ingnore but also seem to be quite unconscious of their ignoring an appreciable number of influential thinkers belonging to the best European traditions. Some names seem to have never been known or, at any rate, are never mentioned in the modern debates about the essence of science in relation to culture. Examples from the French cultural sphere touching upon science, technology, philosophy, ethics, psychology, etc. are Maine de Biran (1766-1824), Félix Ravaisson (1813-1900), Léon Ollé-Laprune (1839-1898), Maurice Blondel (1861-1949), Gaston Bachelard (1884-1962). Bachelard, however, has been recently adduced in the context of a research program (Nilsson, 1987; Nilsson, 1988). In general it is probable that the work of these men as overviewed in European encyclopedias (Dictionnaire des philosophes, 1984; Enciclopedia di filosofia, 1981) is at least as important for the understanding and design of computer systems as the positivistic, marxistic or phenomenological approaches that dominate the Anglo-Saxon arena in these last years.

History: from computers to eclecticism?

What could be, besides what are mostly general approaches mentioned above, a base for culture-critical research with emphasis on computer and information science? Research on the use of computers from the point of view of cultural criticism can start with an overview of the rise of the computer phenomenon and computer education, by means of a selection of articles from various journals (Annerstedt, Forssberg, Henriksson, & Nilsson, 1970; Computer science curriculum, 1964; Datamation , 1977; Edwards, 1962; Information systems-curriculum recommendations of the 80's, 1982; Malik, 1975; Pylyshyn, 1970; Rodgers, 1970; Scientific American, 1966; Scientific American, 1977; Solomonoff, 1966).

A concomitant step would be to relate the above material to a discussion about the nature of technology and technological development, including the economic and political reality (Mayr, 1976a; Mayr, 1976b; Mendner, 1976; Mitcham, & MacKey, 1972; Murray, 1982, an overview; Nordin, 1983, with en extensive bibliography; Quiniou, 1971). In a way this kind of studies will run into other studies suggested elsewhere in the romantic revolt against modern science and technology, as well as in the history of mathematics (Bochner, 1973; Davis, & Hersh, 1986, are examples that are pertinent to the present context; Kac, Rota, & Schwartz, 1986; Kline, 1954; Kline, 1985; Zellini, 1985b), logic, psychology, economics, and statistics. It is then clear that such types of investigations may take us to the dangerous road of uncritical compilatory eclecticism against which warnings have already been advanced (Ivanov, 1988).

A first attempt to avoid falling into the trap of simple eclecticism can be grounded in starting to consider technology mainly in the light of certain continental thought that does not seem to be well known in our academic community (Adorno, 1972; Gehlen, 1967; Gehlen, 1983; Spengler, 1981-1983/1918, with due recognition of its controversial aspects) and a series of challenging but less comprehensive standpoints (Fores, 1982; Jung, 1982; Lyons, 1979). Some of this kind of thinking might have been represented on the Scandinavian scene (Ahlberg, 1974; Ahlberg, 1978) but it departs to some extent from better known approaches that have been more conso-

nant to our particular Anglo-Saxon academic milieu during the last decades (von Wright, 1983; von Wright, 1986).

The "information society": politics and ethics

Attempts have been already made to relate computer and information science more specifically to the debate about the so called information society (Barrett, ; Bolter, 1984; Burnham, 1983; Hoos, 1983; Roszak, 1986; Slack, & Fejes, 1987; Tengström, 1987; Weizenbaum, 1976). One particular attempt has furthermore tried to relate this kind of debate to political science as well as to judicial and theological matters (Ivanov, 1986). It indicates that future work on this subject should be pursued along the lines of thinkers who complement the above mentioned continental tradition and its roots in Greek philosophy with due consideration of Christian ethics. This could be done with the help of e.g. pragmatically influenced bridge from mythology (Jung, 1953-1979; Pauli, 1955; von Franz, 1970, and analytical psychology), as implicit lately in the emphasis on metaphors, over to cognitive psychology in its relations to logic and mathematics in their connections to empirism and technology. It is, in general, a matter of relating science to theology and religion (Blumenberg, 1985; Filoramo, 1985; Guénon, 1982; Heisenberg, 1975; Portmann, 1954; 1969; Poupard, 1986; Weil, 1966; 1970-1974; Weizsäcker, 1959; 1972; Zellini, 1985a; 1985b; 1988).

Because of the absurdly increasing complexity of the subject matter it will certainly be necessary to adopt of style of study and of exposition which is educational or didactic in the best sense of the word, developing the capability of thinking and speaking in "simple" terms on the basis of complexity itself. There are already good example of this (Barrett, 1987; Lewis, 1988).

At any rate we should be able to build further on those who have attempted to introduce at least a minimum of ethical concerns from inside their own disciplines (Brunsson, 1982; Böhler, 1970; Chargaff, 1971; Churchman, 1979; Etzioni, 1988; Gaa, 1977; Gustafsson, 1988; Heisenberg, 1975; Johansson, 1982; Jönsson, 1982; Karier, 1976; Kass, 1972; Sen, 1987; Simpson, 1951; Sjöström, 1980; Tukey, 1975; Zellini, 1988), and particularly in computer and information science (Bellin, 1989; Capurro, 1985; Churchman, 1971; Davis, et al., 1986; Forsgren, Ivanov, & Nordström, 1988; Ivanov, 1986; Ivanov, 1987; Weizenbaum, 1976).

It should be noted that social, socialistic, and marxistic aspects of ethics and morality in terms of responsibility, solidarity, and such, are according to our approach included in the context of Christian values to which they properly belong (Ivanov, 1986; Lewis, 1988). At a quite high level of complexity of analysis there are besides better known works by Reinhold Niebuhr and Paul Tillich, others which insightfully point at the relations between Christianity and socialism (Buckley, 1987; de Lubac, 1983; Guillaumin, 1987; Niebuhr, 1986; Poupard, Lukács, Huber, & et. al., 1987; Riley, 1986; Troeltsch, 1925; Troeltsch, 1974; Troeltsch, 1977). Such insights could possibly clarify why in typically socialistic or marxistically oriented research in computer and information science (Ehn, 1988) sometimes the concept of ethics or morality is barely, if ever, mentioned.

Including the aesthetic dimension in practice

The program for cultural criticism outlined up to now includes the true and the good, but not the beautiful of the classical Greek trilogy. One hypothesis is that this beautiful may be important for the question of action, practice or implementation which is considered elsewhere. A popular journalistic expression of this idea is to say that it helps to make beautiful

that which is true and good, if one wishes to realize it in practice. In the context of research and education in computer and information science we usually say that it must be "fun" if it is going to work in the sense of attracting students and researchers. It is however obvious that fun by itself is not enough and that it may be downright false, immoral or dangerous (Ivanov, 1986, about the "Don Juán syndrome"; Mitroff, 1984). What is meant by positive fun may be rather an analog to a "motorcycle" as it is used by Robert Pirsig in the well known technical-philosophical book "Zen and the art of motorcycle maintenance" (1974), i.e. a pretext or, literally, a vehicle for conveying and important message to the reader, recipient, or partner in a dialogue.

In spite of having been overtly recognized in the systems approach (Churchman, 1979) it is safe to claim that the meaning and importance of the aesthetical dimension in computer and information science has not yet been properly understood. Our proposed orientation towards continental thought may offer a repair to this situation since art and aesthetics, not the least in their relation to science, have been there the object of much attention e.g. in the romantic tradition and its present day disciples (Born, 1963; Bortoft, 1986; Goethe, 1970; Spengler, 1981-1983/1918; Steiner, ; Steiner, 1926/1988; Sällström, 1980). Also in the Anglo-Saxon world have appeared in the last two decades authors who indirectly relate to the aims of this tradition in terms of interest for both ethics and aesthetics in relation to the computer (Barrett, 1987), and for Far Eastern cultures where the aesthetical dimension often has been integrated with the ethical-religious and the intellectual one (Capra, 1975; Jones, 1982; Pirsig, 1974; Zukav, 1980). In doing so they certainly relate to earlier reports which remained less known (Dobbs, 1975; Pauli, 1955) including certain work by the influential founder of psychophysics Theodor Gustav Fechner (1801-1887) and others.

Nowadays this ambition to integrate science with art and aesthetics shows up more seldom and in less glamorous, simpler forms but there have been lately attempts to call the attention upon the aesthetic art dimension such as drama in the context of computer science (Andersen, & Mathiassen, 1986; Hilton, 1987; Hilton, 1988). They remind certain aesthetic-mythological approaches to memory as they could be relevant to the theory of data bases (Bolzoni, 1987; Yates, 1966).

Cultural criticism as an integral part of a research project may finally have a cathartic effect on the researcher in that it can foster humility and tenacity as one confronts the vastness of the problem situation. If anytning, the vast complexity could make us suspect that the problems are wrongly formulated and that we are looking at the wrong things, needing a kind of Copernican revolution that decreases our need of more data while facilitating the grasp of the data we already have.

Many ambitious and insightful researchers are tempted to desert university research when they are faced with the impotence of their efforts. A humble attitude of mind might help to make us realize that we all are participants of a higher drama in which we cannot claim to play a powerful central role, that would amount to hubris. The wish for power, a word which has become so common in the context of computer science, may be part of the trouble (Barrett, 1987, pp. 74; Ivanov, 1989b). Even granted that this drama may attain the proportions of a gigantic apocalyptic cultural crisis, a real "decline of the West" which prevents easy pragmatic results

within our short lifespan, it still does not prevent our research from being meaningful, pointing to "beyond ourselves" and to future generations.

An example: Journalism takes over science's responsibilities?

Do references to critical theory and philosophy imply that scientific research expands into areas which do not legitimately belong to science, usurpating the rights of other fields of intellectual activity? Here it is claimed, on the contrary, that these other fields - and journalism in particular - shows more sensitivity for problems that we should also have responsibility for. As an example we have chosen a series of recent newspaper articles about modern German philosophy (Zivkovic, 1989a; 1989b) as they touch upon some of the matters that were mentioned above in a much more detailed and engaged way than can be perceived in the university environment in which research is performed.

Karl-Otto Apel as a main exponent, together with Jürgen Habermas, of contemporaneous critical social theory is interviewed about his normative view of ethics, a view that he shares with most modern philosophers after Kant. It is a view which is associated with a strong belief in the capability to solve ethical conflicts by means of duty and rationality. Under the eighties, however, this normative ethics has been criticized by the new current of "neo-aristotelianism", represented in Germany by such names as Joachim Ritter's heir Odo Marquard and Hermann Lübbe, and in the USA by Alisdair MacIntyre, Charles Taylor and Bernard Williams. It is a kind of postmodern ethics, an enlightened skepticism which distrusts philosophy's capability to give definitive answers to ethical questions. Ethics would do better by freeing itself from morals since the latter is too abstract and reductionistic when it bases itself on general concepts such as "justice". It is only interested in setting up rules and does grasp only the concept of duty. Duty ans norms are only a small part of ethics. Ethics starts with the individual's concrete experience which should be confronted with a revived Aristotelian eudemonism, a concept of what good life and wellbeing is all about Ethics should not be based on social contractual or consensual thinking, of which Habermas' critical theory is a variant, and which tends to turn the individual into an abstract byproduct of a system of thought: man in there envisaged as a Kantian-influenced actor who is rational but nonsocial and nonhistorical.

Habermas' and Apel's critical theory rejects this neo-aristotelianism and refuses a return to the post-structuralists' "purely aesthetical" interpretations of thinkers like Nietzsche and Heidegger. The new generation of critical theorists like Axel Honneth, Martin Seel and Norbert Bolz, however, seem to come close to the neoaristotelian standpoints when dealing with e.g. the power aspects of communication (cf. Axel Honneth's *Kritik der Macht*, Suhrkamp, 1985) and with ethics and aesthetics. A close look at the neoaristotelian Odo Marquard puts into evidence that current's interest for "tradition" as a necessary platform for change and "polyteistic" improvement, even if Marquard himself shuns talking about religion. Continuous positive justification, explanation or rationalization of all "why not" challenges to reform status-quo cannot be obtained within the frame of possible efforts. Habermas' and Apel's universalism as expressed in emphasis on universal rules, e.g. about rationality, is an impediment for that pluralism and respect for uniqueness which is necessary for tolerance and emergence of improvements. A problem with universalism is also the paradoxical fact that while universal values such as justice and equality are nominally spreading on the surface of the earth, a

decreasing part of the concrete life follows general rules. Philosophical ethics, like ethical discourse, obviously cannot rescue us. A certain reliance on tradition is necessary.

In spite of philosophical leaders's eschewing spiritual and religious matters there is a marked increasing interest for these matters among students, to the point that prof. Wolf Lepenies, at Wissenschaftskolleg of Freie Universität in West Berlin sees a risk that humanities become a center for cultural pessimism characterized by anti-Enlightenment and irrational tendencies.

It is not obvious that so called neoconservative tendencies have strengthened the position of the Church, but it is rather so that environmental movements and other social movements do not anymore attract teenagers. They are rather attracted by a new spiritual, not necessarily confessional, search. An interviewed free philosopher, Peter Sloterdijk, in a way that is symptomatical for the attitude towards religion, observes that "it is possible to make up a good argumentation without getting in the motherly embrace of the holy Church".

The spiritual interest is welcome also in the one only private university in Witten-Herdecke, founded by a group of anthroposophers and businessmen, where physicians, natural scientists and economists complete their specialist studies with humanistic education in "the fundamentals", a combination of philosophy, art and history. The initiative is led by Peter Koslowski who together with Reinhard Löw is also director for a new research institute for philosophy and public law in Hannover. It is financed by the catholic Church represented by bishop Josef Homeyer, and its purpose is the revival of the study of the condition of modern man against the background of 2000 years of Christian tradition.

Both Koslowski and Löw are students of Robert Spaemann's school of thought established in München since several decades, and they base their whole activity on Christian humanism. Sometimes they claim to represent postmodernism but according to prof. Wolfgang Welsh at Freie Universität, their diagnosis and their program is certainly in sharp opposition to what has been known elsewhere as postmodernism. They speak for a healing through integration, a "unity of the living world" which will be attained through a new essentialism and a return to Christianity. They to link a premodern view of man to a new free thinking, and they represent a particular German form of neoaristotelianism. Their philosophy is not conservative but rather "restaurative", there is something valuable that has to be reinstated.

In several respects this philosophy is opposite to the "radical" German neoaristotelianism that distrusts natural law and equates belief in human rights with belief in superstition and fiction. Human rights are appreciated as one of the few good things that modernity or the modern project explicitly developed out of Christian thought. And while the radicals in most cases reject teleology, Koslowski and Löw base most of their arguments on the view that living beings have their natural destiny in a purpose. In spite of teleology having being discredited in science during the last two centuries it has yet been popular in another form, in the belief in the modern project and, as philosophy of history, in the view of the possibility for history's development towards progressively higher forms of consciousness and emancipation. Koslowski has also recently published a book (Koslowski, 1988, Gnosis und Mystik in der Geschichte der Philosophie, Artemis, 1988) were an attempt is made to ground economics

on ethical thinking, a practical requirement that recently has been well illustrated in a less theoretical form (Revans, 1989). Koslowski directs his attention towards gnosticism, a system of religious philosophy that originally flourished in the first six centuries of the Church, to be seen as a way for rational understanding of Christian faith, in a manner akin to its appearance in the humanism and psychology of Carl G. Jung.

It should be remarked, however, that the above approach considers that a gnostic tries to "justify religious claims rationally and philosophically" in order to maintain a dialogue with exponents of other religions, and that gnosticism, as opposed to "pure revelation religion", is more tolerant towards other religions. In spite of this deserving the sympathy of most intellectuals the risk is, of course, that a vaguely defined reason, philosophy or science is overruling the religious sphere. It is possible to find occasions even in the sphere of mathematics where we are reminded that knowledge of God, seen as an ultimate purpose of human life, may be arrived in three ways: the way of imagination, the way of reason, and the way of revelation (Davis, et al., 1986, pp.235-236).

Conclusions

By means of what may look as a digression into journalistic presentation of modern philosophical debate it should be by now evident that cultural criticism should be considered an integral part of our proposed research. Many of the broader human science issues which appear in the context of research about computers and societal computerization (Ivanov, 1986) recall classical issues of the relation between e.g. reason, logic, philosophy, politics, ethics, and religion. The name of J.G. Fichte was singled out among many possible at the beginning of this essay. The breadth and depth of his concerns were relevant to our issue as much as his work is ignored in our Anglosaxon cultural setup. His concerns for relating human science methodological issues to the theory of law, to ethics, and religion, for instance, complement in a significant way the most ambitious attempt that were made in our milieu with the purpose of reinstating the importance of human science in an age which requires broad systems thinking (Liedman, 1977). Our limitations in this respect can be exemplified by completing several of my references above with certain works which on the basis of my experience I guess are completely unknown or unattended in the academic debate on methodological issues of human science (de Lubac, 1983; Lewis, 1988; Lindbom, 1977; Rauhala, 1973; Reichmann, 1989; Rychlak, 1977; Zetterberg, 1984).

The journalistic dimension of our exposition reminds us that a morning newspaper that oviously addresses not only professional philosophers but also the public of intelligent laymen must necessarily include in its audience intelligent computer or information scientists. It would be absurd to assume at the outset that these scientists should keep their insights and reactions private and isolated from their scientific work, as if the reading of such material were a kind of pure entertainment.

It is also to be remarked that to our knowledge, the proposed research is the only one to have been formulated in Scandinavia that allows for consideration, in the field of computer and information science, of the issues touched in the debate. While others have expressed interest for, but not yet really applied the main communicative or cooperative ideas of critical social theory (Ehn, 1988; Lyytinen, 1986), it has been the background of our research proposal to link the question of power in computation and communication (Forsgren, et al., 1988; Ivanov, 1972) to power in law and poli-

tical science and, through gnostic analytical psychology, to theology (Ivanov, 1986; 1989a; 1989b). Almost "desperate" and controversial attempts in similar respects are apparently being made also by researchers not only in the "new physics", but also in management and business administration (Smith, 1990).

It is in a sense remarkable that most Scandinavian research on computer and information science probably has nothing to say nor to comment upon the ongoing debates on modern currents in German philosophy as it does not deem itself related to them. It could be believed that the reason lies in the irrelevance of these matters for research related to information technology. Some sensitivity for what is going on in research journals, however, will reveal that these problems are producing highly significative symptoms (Cohen, 1983; Davis, 1987; Leith, 1987; Mozes, 1989, are just examples), that in turn actualize historical debates (Schiller, 1912; Veatch, 1969, also as two examples in the field of logic) that have been left in irresponsible oblivion by the scientific community. A reasonable judgement is then that such a circumstance constitutes an argument for considering that our ideas have also a general import including scientific cooperation on the European scene, and that the research proposed here.deserves to be supported with both resources intended for human sciences and for natural-technological sciences.

When it comes to evaluating such research there will be probably a reference to methodological issues of human sciences. My question to those who have studied these issues during a longer time is: how will and how should the program of inquiry proposed in this "reader" be evaluated?

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